

CLAIMS

1. A system for starting an automatic car in safety, comprising:
  - an engine speed detecting unit detecting the current speed (RPM) of an engine;
  - a foot brake input detecting unit detecting whether a foot brake is operative;
  - a gear position detecting unit detecting whether a gear shift lever is in the neutral (N) position;
- 10 a vehicle speed sensing unit being operated parallel with the foot brake input detecting unit and sensing the speed of a vehicle;
- a vacuum apparatus sucking air in a Hydro-vac by being driven by an operating power supplied from a battery when the key switch is in an ACC state;
- 15 a control unit making the engine not started when the foot brake is not operative and the gear shift lever is not in the neutral position in the step of starting the engine, locking the gear shift lever not shifted in the neutral position until the engine speed is lowered to less than a reference value after the engine is started as the above condition is satisfied, and controlling a vacuum apparatus to be turned off when the engine rotates;
- a gear shift lever locking device fixing the gear shift lever to the neutral position if the engine speed is more than a reference value upon

starting under the control of the control unit; and

a starting device starting the engine under the control of the control unit.

5        2. The system of claim 1, wherein the foot brake input detecting unit includes a pressure sensor which is installed on the oil pipe connecting the Hydro-vac on the center and a hydraulic cylinder for a foot brake operation installed in each of the wheels and detects the pressure of brake oil.

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3. The system of claim 1, wherein the vehicle speed sensing unit has a vehicle speed sensor, the vehicle speed sensor being connected to a foot brake sensor of the foot brake input detecting unit in parallel.

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4. The system of claim 1, wherein the gear shift lever locking device is constructed in such a manner that a groove is formed on a gear shift lever, an electronic solenoid coupled with a stopper is operated upon the applying of power so that the stopper can be inserted into the groove, and the opposite side of the moving axis of the 20 electronic solenoid coupled with the stopper is fixed by a spring so that the stopper cannot be inserted into the groove when power is not applied.

5. The system of claim 1, wherein the Hydro-vac is connected to the vacuum apparatus via the check valve preventing the backflow of air to the Hydro-vac and oil pressure sensor is installed on a hydraulic cylinder of the Hydro-vac for detecting an oil pressure.

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6. The system of claim 5, wherein the oil pressure sensor is installed on an oil pipe of the Hydro-vac.

7. A method of starting an automatic car in safety, which uses  
10 the system for starting an automatic car in safety comprising an engine speed detecting unit, a foot brake input detecting unit detecting whether a foot brake is operative, a gear position detecting unit, a vehicle speed sensing unit, a control unit, a gear shift lever locking device fixing the gear shift lever under the control of the control unit, a  
15 starting device starting the engine and a vacuum apparatus sucking air in a Hydro-vac by being driven by an operating power applied from a battery when the key switch is in an ACC state, comprises the steps of:  
turning on an ACC switch (S100);  
turning a Hydro-vac providing a brake oil to a foot brake into a  
20 vacuum state (S110);  
turning on an engine start switch (S120);  
detecting the positions of a gear shift lever and the foot brake  
(S130);

as the result of the detection, determining the position of a gear shift lever and the operation state of the foot brake (S140);

as the result of the detection, starting the engine if the gear shift lever is neutral position and the foot brake is operative (S160), or not

5 starting the engine if not (S150);

detecting an engine speed (S170);

determining whether the engine speed is less than a predetermined reference value (S180); and

as the result of the determination, disabling a gear shifting unless

10 the engine speed is lowered to a reference value (S190), enabling the gear shifting if so (S200a), detecting a vehicle speed (S200b) and turning into a restartable state without operating the foot brake even the engine is turned on.

15 8. The method of claim 7, wherein the method further comprises the steps of:

determining whether the engine is stopped after the detection of the engine speed (S172) after the step of detecting an engine speed (S170); and

20 according to the determination for the engine stopping, stopping a vacuum apparatus 70 if the engine is not stopped (S174), or returning to the step of turning the Hydro-vac into a vacuum state by maintaining the vacuum apparatus if not (S176);

9. The method of claim 7, wherein the foot brake input detecting unit includes a foot brake sensor SN2 and the vehicle speed sensing unit has a vehicle speed sensor SN1 sensing the speed of a vehicle, the  
5 vehicle speed sensor SN1 and the foot brake sensor SN2 being connected in parallel so as to be operated in parallel.